

# NASA TECH BRIEF

## *Marshall Space Flight Center*



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### Parallel-Gap Welding for Joints Between Copper Conductors and Kovar

An investigation into the feasibility of employing parallel-gap welding to produce joints between component lead ribbons of Kovar (consisting of nickel, cobalt, and iron) and copper conductors showed that such a technique would produce more reliable joints than soldering. Soldering is the method most commonly used, but the joints formed often prove unreliable under extreme environmental conditions such as rapid ambient pressure changes, thermal expansion differentials, and severe shock and vibration forces.

The investigation included evaluation tests using several different sizes of copper conductors and component lead ribbons. It also included different platings for corrosion protection, and for overcoming mismatches of the thermal and electrical conductivities and melting points of the metals being joined.

One conclusion was that the success of the joint depends on the type of plating over the copper conductors and lead ribbons, but is not dependent on ribbon and copper sizes. The optimum combina-

tion was found to be gold-plated component lead ribbons and solder-plated (coated) copper conductors.

#### **Note:**

The following documentation may be obtained from:

National Technical Information Service  
Springfield, Virginia 22151  
Single document price \$3.00  
(or microfiche \$0.95)

#### **Reference:**

NASA-TN-D-6236, Parallel Gap Welding  
Kovar Ribbons to Copper Conductor Printed  
Wiring Boards

#### **Patent status:**

No patent action is contemplated by NASA.

Source: G. E. McDaniel  
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